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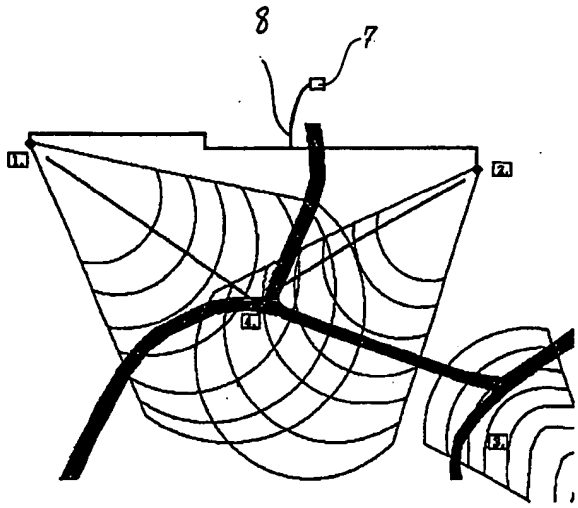

(57) Abstract

An account has been given of a method and an installation for generating a warning signal transmittance from an activatable/deactivitable, sensor–controlled transceiver mounted in a hidden position within a motor vehicle or other displaceable object, e.g. a boat, and wherein the sensor is adapted to receive positional signals from a GSM system (1, 2, 3) and, in the activated state of readiness, to react on displacement/positional change of a car (4), by causing the transceiver to deliver said warning signal transmittance to an alarm central station together with positional signals. An illegal displacement may make itself known as a discrepancy upon the sensor–controlled transceiver's comparison of the latest received positional signals with the positional signals received just before.

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A METHOD AND AN INSTALLATION FOR THE GENERATION OF A WARNING SIGNAL TRANSMISSION FROM A SENSOR IN A MOVABLE OBJECT

This invention relates to a method for the generation of a warning signal transmission from an activatable/ deactivatable sensor mounted in a hidden position in a motor vehicle or another movable object, said sensor being adapted to receive positional signals, and where outgoing signals/ data from the sensor which may comprise identification data for the vehicle/object, in association with a theft of the vehicle/- object, are transmitted to an alarm central which receives the positional data of the vehicle/object, and where the sensor is programmed to receive positional signals.

Whenever the invention is associated with a GSM system outgoing signals/data from the sensor, which may consist of identification data for the vehicle and network parametres deduced from GSM base stations or other stations for corresponding areas divided into zones, with intermediate zone borders for partially overlapping GSM zones corresponding to the coverage field of each GSM base station,in association with a theft of the vehicle or another movable object, are transmitted to an alarm central receiving positional signals relating to the vehicle/object, and wherein the sensor is programmed to receive positional signals in the form of parametres from the respective GSM base stations.

Likewise, the invention deals with an installation for the generation of a warning signal transmission from a sensor mounted in a hidden position in a motor vehicle or another movable object, and wherein signals/data outgoing from the sensor and which may consist of identification data for the vehicle and network parametres deduced from the GSM base stations or other stations for position signal transmission, e.g. corresponding areas divided into zones having intermediate borders for partially overlapping zones, or other systems, in association with a theft or another illegal positional change of the vehicle (the object), are transmitted to an alarm central, wherein the position of the vehicle at any time can be computed on the basis of the data received, the sensor being programmed to receive positional signals from the respective GSM base stations. This installation is built up in a constructively simple way for carrying out the method in a suitable manner.

GSM is the abbreviation of Global System for Mobile communication, which in the last few years has been built out primarily in order to operate the mobile telephone service. Large parts of the world are connected to this base network consisting of local, directionally determined signal intermediaries. Each GSM base station mediates its signals to communicating objects within its catchment field, which may vary from a few hundred metres up to more than 30 kilometres. Normally, adjacent GSM zones will overlap each other, so that they together form a covering "carpet" of mutually cooperating electronic signal intermediaries on mutually adjusted frequencies. Each GSM base station assigned to the particular zone thereof, has an identity of its own, the GSM system at any time "knowing" which base station/zone that is coupled in for all traffic on the network. When a mobile telephone user moves from one place to another, the mobile telephone traffic of said user will automatically be switched over to the closest base station/zone which sends the traffic on.

A position monitoring system called "Ankervakt" (= "Anchor Watch") is known. This system is based on the socalled GPS system, abbreviated for Global Position System, which is based on the use of 3 - 7 satellite bearings for the exact determination of a position. This system is e.g. used by boat owners who, when staying in their anchored boat, at any time, e.g. in the dark (at night), will receive signals in case the boat makes leeway. Thus, the system will secure that the boat/object is allotted a warning signal in case it occupies a position differing from the predetermined position. This GPS system is not particularly suited for use in connection with thefts where cars and other movable objects, subsequently to the theft, usually are displaced across a substantial distance.

From U.S. patent specification No. 5,218,367 it is previously known a method and an installation where a sensor-controlled transmitter in a car is adapted to be activated upon break-in in the car, wherein the activation releases transmission of signals/data to an alarm central station. The data will consist of identification data for the car and network parametres deduced from the GSM base stations. On the basis of the data received, the alarm central station can compute the position of the car. This known warning method and alarm installation are based on deactivatable/activatable sensors which, in an activatable position of readiness, are adapted to react on preferably physical influence deduced from a break-in in order to provide an entry to the interior of the car, not necessarily with the objective of stealing the vehicle.

In this known warning method and installation where several sensors are used, one can not compensate for lacking or erroneous activation during the break-in through the car door, at a later stage, during the illegal displacement of the car/positional change thereof, because the sensors of the installation are not adapted to be activated for the release of a warning signal transmittance, etc., due to the fact that

the car is (illegally) in motion.

U.S. patent specification No. 5,208,756 deals with a similar installation where the calculations concerning the positions of the car are carried out within the car, the transfer of the positional data being effected to a central station.

According to the present invention, the activation is generally based on a (illegal) displacement/positional change of a motor vehicle or another movable object, i.e. that, when a sensor in the form of a transceiver receives one or more signals, the sensor interprets this signal or these signals, respectively, to be tantamount to a (illegal) displacement of vehicle/object, the sensor reacting by delivering a warning signal transmittance which said alarm central station receives and which opens the warning installation's receipt, storing and comparison of positional signals received, forwarding said signals continuously to the alarm central station.

In accordance with the invention, said objects are realized by proceeding as set forth in the characterizing clause of claim 1. An installation for suitable carrying out this method is defined in the characterizing clause of claim 7. After the sensor-controlled transceiver, from a deactivated position of non-readiness, the sensor, by the owner of the motor vehicle/ the movable object, on e.g. a parking place, is brought into an activatable position of readiness, the sensor will react on said displacement/positional change [put into expression through comparisons of received positional signals whenever the sensor records that the last received signals (beyond allowed tolerances) differ from the already received, stored positional data] and be activated for delivering said warning signal transmittance from the transceiver. As will appear from the following, the first discrepancy upon a comparison between the latest received positional signals and the last but one received positional signals may release ignition of a warning lamp within the

car/object, while the following comparison operation resulting in a similar discrepancy, may be adapted to release the warning signal transmittance from the transceiver to the alarm central station. As the sensor-controlled transceiver exclusively reacts on the displacement/positional change of the car/object, an imperfect or insufficient activation in the very beginning of the theft might be compensated for anytime later during the displacement of the car/object. The sensor-controlled transceiver transmits itself the positional signals to the alarm central station which, entirely from the beginning of the theft will record the warning/alarm as a "vehicle/object stolen with 100% certainty".

Claim 4 defines the invention as utilized and used in connection with a GSM system, and the invention is described in connection with such a system in the following. When e.g. a car, a pleasure craft, a container or another movable object by its owner is left on a parking place, an anchoring place or the like within a GSM zone, where the owner brings the transceiver into an activatable position of readiness, the GSM base station belonging thereto will, with its own identification number in the GSM chain, continuously interpret signals outgoing from the activatable, non-activated transceiver.

If the above-mentioned car, etc., with its activated transceiver, upon a theft is displaced out of the GSM zone ("zone 1") in which the parking took place, and lands in an adjacent zone ("zone 2"), devices and arrangement according to the invention may, in one case in connection with an examplary embodiment, be such that signals from said adjacent zone causes ignition of a smaller signal lamp within the car, etc. Generally, this signal lamp ignition indicates that the car, etc., has entered into "zone 2", simultaneously as it is a warning to the owner that he/she has negleted to deactivate the transceiver (e.g. by means of his/her remote control device). If the stolen car, etc., in accordance with this examplary embodiment, enters into a further, adjacent GSM

zone ("zone 3"), the alarm signals will be transmitted to the alarm central station without further delay.

Any car or other displacable object equipped with a signal-transmitting, sensor-controlled transceiver could, in a stolen condition, be tracked on its course in accordance with the method as proposed by the present invention. Each time the vehicle, etc., enters into any new GSM zone, this is displayed on a screen, simultaneously as every new base station transmits information to monitoring equipment of licensees, said information being displayed on the same screen or a screen coupled in parallel thereto, informing which police station is the nearest and the telephone numbers thereof. This occurs also if the stolen car/boat, etc., returns to the point of departure (the parking place, the anchoring place, etc.). In all GSM zones, the distance between vehicle/object and base station will be transferred to the alarm central station. This continuous monitoring of the travelling of the car could be tracked across the borders between various countries and everywhere covered by an efficient GSM network.

The sensor-controlled transceiver should be mounted in a hidden position in the body of the motor car. The transceiver could be assigned an accumulator battery of its own, e.g. intended to secure transmittance of at least 70 hours. Such an accumulator battery will, as known, be adapted for activation only when the remaining sources of electrical current have been uncoupled (destroyed).

An examplary embodiment of an installation for carrying out the method according to the invention is diagrammatically illustrated in the accompanying drawings, wherein:

Figure 1 shows a transceiver 5 which, in principle, consists of a simplified mobile telephone having a GSM module, a micro controller, a logical unit, a transmitter unit and a signal receiver for an activating remote control 6, but without a

usual keyboard, display and duplex microphone. The transceiver 5 which is intended to be mounted at an inaccessible place, somewhere within the body of the motor car (hidden mounting), is deactivatable/activatable and becomes, from a deactivated position of non-readiness, brought into an activatable position of readiness by means of the remote control 6 which, likewise, is used to bring the transceiver 5 into a deactivatable state from an activatable/ activated condition. Digital signals transmitted upon activation define the car's, etc., identifications stored in the alarm central station's data base, such as registration number, type indication, colour and the like, as well as the owner's name, address, insurance company, telephone numbers and the like.

Figure 2 illustrates diagrammatically how one proceeds in order to generate the intentional warning signal transmittance wherein, in a parking zone 1, stationary monitoring of a car (or other displacable object) 4 is exerted, wherein a positional change of the car/object 4 upon its displacement into an adjacent zone 2 - according to one possible embodiment - ignition of a warning lamp within car/object is effected. This warning has exclusively the task of making the car's 4 owner aware of the fact that he/she has forgotten to deactivate the activatable transceiver 5 (on the parking place) and give him/her the opportunity of carrying out deactivation and avoid false alarm. On the other hand, if the car's/object's 4 displacement/positional change is due to a theft, the ignition of the warning lamp has no purpose. The thief will not be in a position to localize the hidden transceiver, and nor is he/she in a possession of a remote control with which deactivation could be effected. When the stolen car/object enters into "zone 3", which may be any zone next to zone 2, the transceiver 5 is activated for transmitting alarm/warning signals through ISDN telephone network 8 to licensed alarm central station 7, which may be in a continuous contact with the nearest police authority.

The data base of the alarm central station 7 is programmed in order to display the police authority being the nearest at any time and the telephone number thereof. Whenever a car/ object is displaced in the activated condition, the most topical police authority is automatically connected.

Also, the alarm central station 7 will be connected to the "Auto SYS" registers of the State through the ISDN network for continuous updating of the data base, e.g. when a car changes owner, owner changes car, insurance company and the like. Also, the system could be connected to the State's property registers, in order to coordinate building positioning of subscribers in GIS map systems.

C l a i m s

1. A method for the generation of a warning signal transmittance from an activatable/deactivatable sensor (5) mounted in a hidden position within a motor vehicle (4) og other displacable object, and wherein the sensor (5) is adapted to receive positional signals, and wherein the sensor's (5) outgoing signals/data which may contain identification data for the vehicle/object (4), in association with a theft of the vehicle/object (4), are transmitted to an alarm central station (7) receiving the positional data of the vehicle/object, c h a r a c t e r i z e d i n that said hidden sensor has the form of transceiver (5) which is programmed to store the positional signals received and, from a deactivated condition of non-readiness, e.g. on a parking place, is brought to take an activatable state of readiness, in which the transceiver (5) can react on an illegal positional change (displacement) of the vehicle/object (4) and, thus, deliver said warning signal transmittance to the alarm central station (7).

2. A method as set forth in claim 1,
c h a r a c t e r i z e d i n that the transceiver (5) is brought into an activatable condition of readiness from a deactivated condition of non-readiness for, thereby receiving and storing received positional signals as well as comparing the latest received positional signals with the positional signals received and stored just before and, upon discrepancy within reasonable tolerances, to deliver said warning signal transmittance to the alarm central station (7), possibly after first having caused ignition of a warning lamp in the vehicle/object.

3. A method for the generation of a warning signal transmittance from a signal/data transceiver (5) mounted in a hidden position within a motor vehicle (4) or other displacable object, and wherein the transceiver's (5)

signals/data, which may consist of identification data of the vehicle (4) and network parametres deduced from GSM base stations or other stations for corresponding areas divided into zones having intermediate zone borders for partially overlapping GSM zones corresponding to each GSM base station's field of coverage, in association with a theft of the vehicle (4) or other displacable object, are transmitted to an alarm central station (7) receiving positional signals concerning the vehicle/object (4), and wherein the transceiver (5) is programmed in order to receive positional signals in the form of parametres from the respective GSM base stations, c h a r a c t e r i z e d i n that said hidden signal/data generating transceiver (5) which is programmed to store the received positional signals, from a deactivated state, e.g. on a parking place, is brought to take an activatable state in which the transceiver can react on and become activated due to an illegal displacement of the vehicle when the vehicle (object) e.g. passes a GSM radio wave and/or enters into a new GSM base station zone's field of coverage and which may be reflected by the fact that one or more new GSM stations are transmitting positional signals received by the transceiver (5), said positional signals being stored in the same as well as compared with already stored positional signals, the transceiver (5) upon a discrepancy at said positional signal comparison being activated immediately, delivering said warning signal transmittance to the alarm central station (7).

4. A method as set forth in claim 2 and 3, c h a r a c t e r i z e d i n that the transceiver (5), subsequently to the activation and the delivery of the warning signal transmittance, possibly subsequently to the ignition of the warning lamp within the vehicle/object (4), transmits the received new positional signals from the GSM system during the above-mentioned conditions further to the alarm central station (7).

5. A method as set forth in claim 1, c h a r a c t e r i z e d b y using as said warning signal transceiver a mobile telephone based transceiver (5) having a micro controller and a logical unit, and that the transceiver (5) is brought into an activatable state or a deactivatable state from an activatable or activated state, respectively, by using a remote control of a type known per se.

6. A method as set forth in claim 1 or 2, c h a r a c t e r i z e d i n that said alarm central station (7), if the owner of the vehicle has forgotten his/ her remote control and, thus, can not deactivate the transceiver (5) made activatable (e.g. the night before), is brought to deactivate the transceiver (5) so that it does not transmit warning signals upon a displacement of the vehicle (object).

7. An installation for the generation of a warning signal transmittance from a sensor (5) mounted in a hidden position within a motor vehicle (4) or another displacable object, and wherein the sensor's (5) outgoing signals/data, which may consist of identification data for the vehicle (4) and network parametres deduced from GSM base stations (4) or other stations for e.g. corresponding areas divided into zones having intermediate borders for partially overlapping zones or other positional signal transmitting systems, in association with a theft or another illegal positional change of the vehicle (4) (object), are transmitted to an alarm central station (7), and wherein the position of the vehicle (4) can be computed at any time on the basis of the received data, and wherein the sensor (5) is programmed to receive positional signals from the respective GSM base stations, for carrying out the method as set forth in claim 1 or 4, c h a ra c t e r i z e d i n that said hidden signal/ data generating sensor has the form of a transceiver (5) programmed to store received positional signals and which, from a deactivated condition of non-readiness, is adapted to be transferred into an activatable position of readiness,

in which the transceiver (5) upon displacement of the vehicle (4) for a certain stretch which, possibly, could vary from case to case, is adapted to be brought into activated, operative position for transmitting warning signals/data to the alarm central station (7), the transceiver (5) being adapted to maintain its receiving/storing/transmitting state and receive positional signal concerning illegal displacement of the vehicle (4) each and every time the vehicle (4), which is situated within an area divided into zones, passes a GSM radio wave and/or enters into a new GSM base station zone's field of coverage, transmitting the new positional signals successively further to the alarm central station (7).

8. An installation as set forth in claim 7, c h a r a c t e r i z e d i n that the transceiver (5) is a mobile telephone based transceiver (5) having a micro controller and a logical unit, and that the transceiver (5) from a deactivated state of non-readiness is adapted to, e.g. by means of the owner's remote control, be brought into an activatable position of readiness where the transceiver (5) is adapted to be activated upon the vehicle's (4) and the transceiver's (5) displacement and to react by delivering said warning signal transmittance, possibly after a warning lamp has been ignited within the vehicle/object.

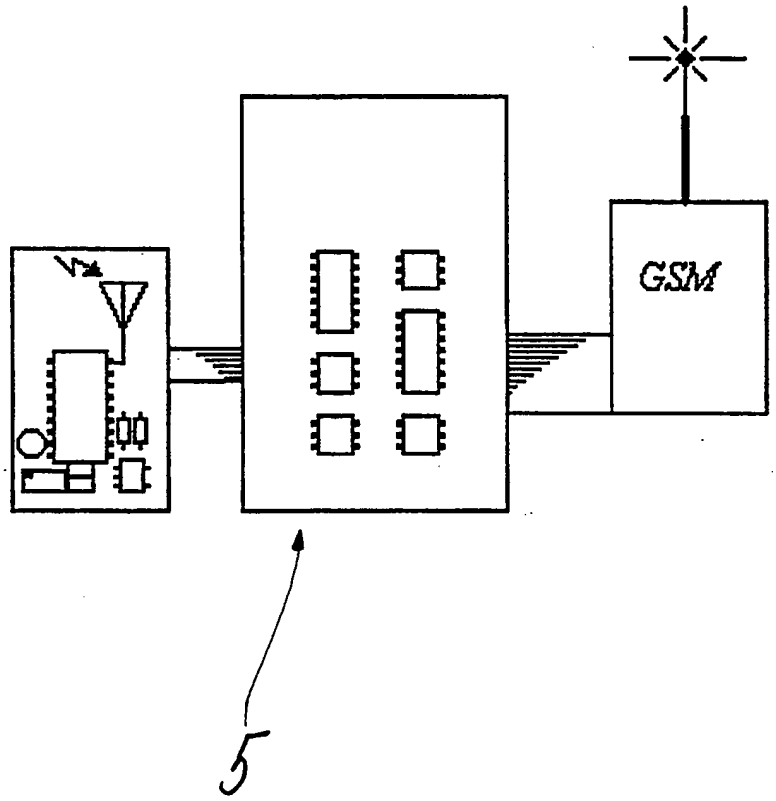

Fig. 1

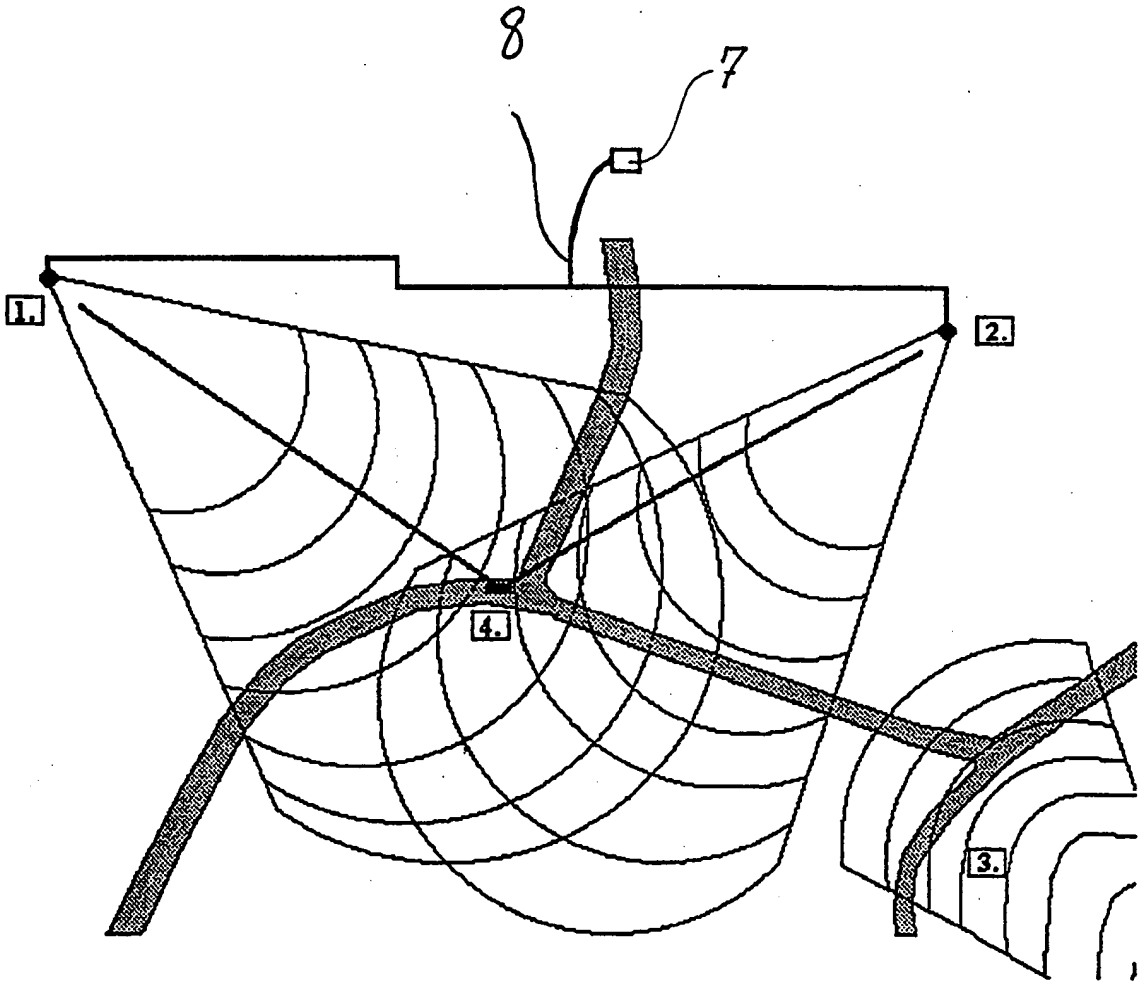

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NO 98/00010

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G01S 5/00, B60R 25/10, G08B 25/10
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G01S, G08B, B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2280527 A (SECURICOR DATATRAK LIMITED), 1 February 1995 (01.02.95), page 4, line 13 - page 5, line 18, abstract	1,2
Y		3,7
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X	EP 0242099 A2 (ADVANCED STRATEGICS, INC.), 21 October 1987 (21.10.87), abstract	1
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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

Information on patent family members

29/04/98

International application No.
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